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(54) **PRINT MEDIA CARTRIDGE WITH INK SUPPLY MANIFOLD**

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(52) **U.S. Cl.**

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See application file for complete search history.

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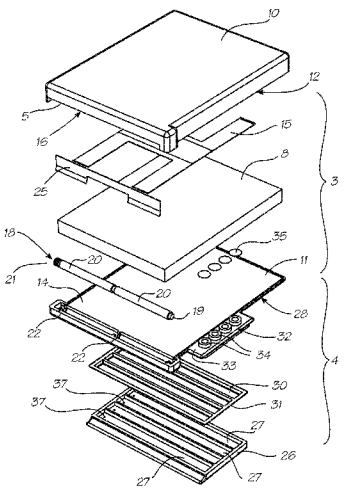
(57) **ABSTRACT**

An ink and print media cartridge for a printer device includes a print media housing assembly configured for insertion and removal to and from the printer device, the print media housing assembly having a top molding coupled to a bottom molding and a print media storage volume defined therebetween; an ink housing assembly attached to an outer surface of the bottom molding, the ink housing assembly defining an ink chamber with the outer surface of the bottom molding; a spring provided between the top molding and the bottom molding, the spring positioned to bear on one side against the top molding and on an opposite side against print media stored in the print media storage region; and a feed mechanism provided within the print media housing, the feed mechanism having a drive gear protruding externally from the print media housing. The drive gear is positioned to engage with a complimentary drive mechanism of the printer device upon insertion of the print media housing into the printer device.

20 Claims, 11 Drawing Sheets



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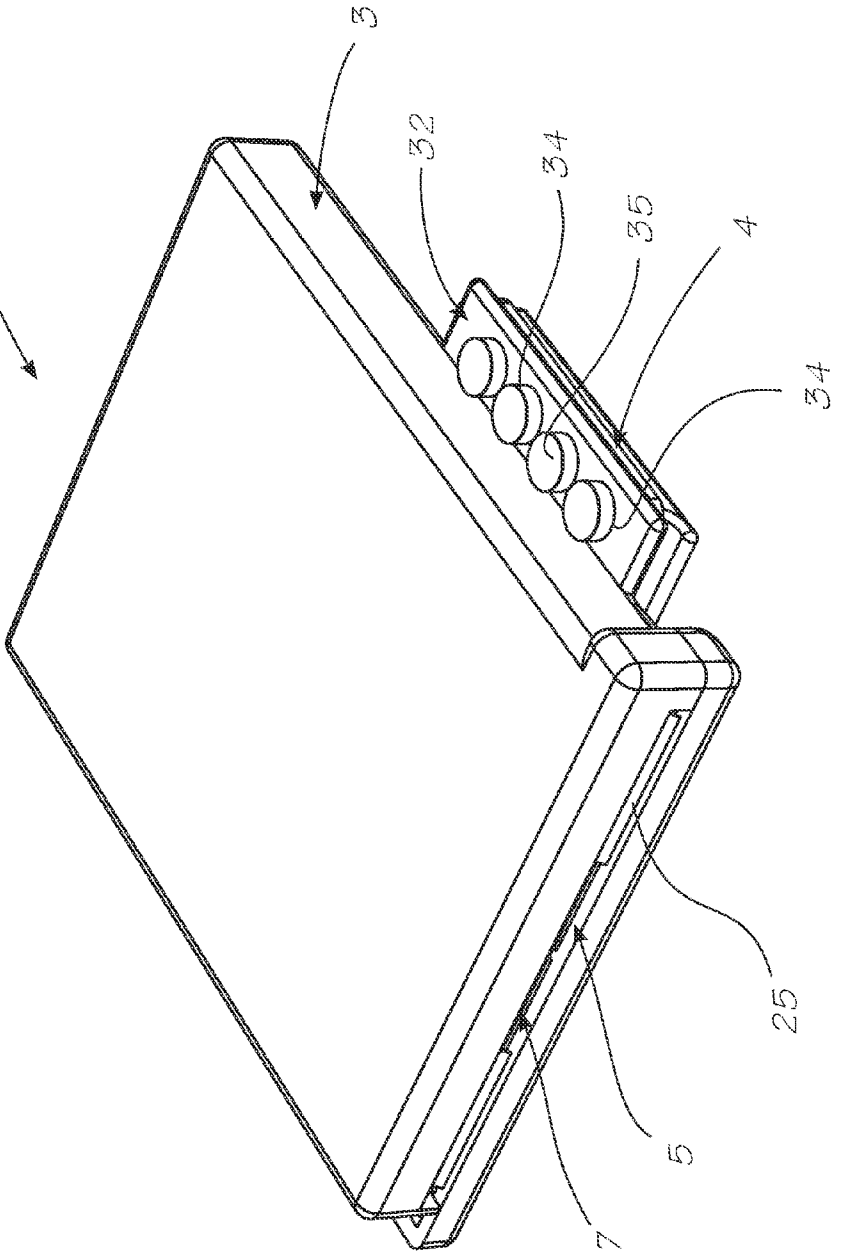

FIG. 1

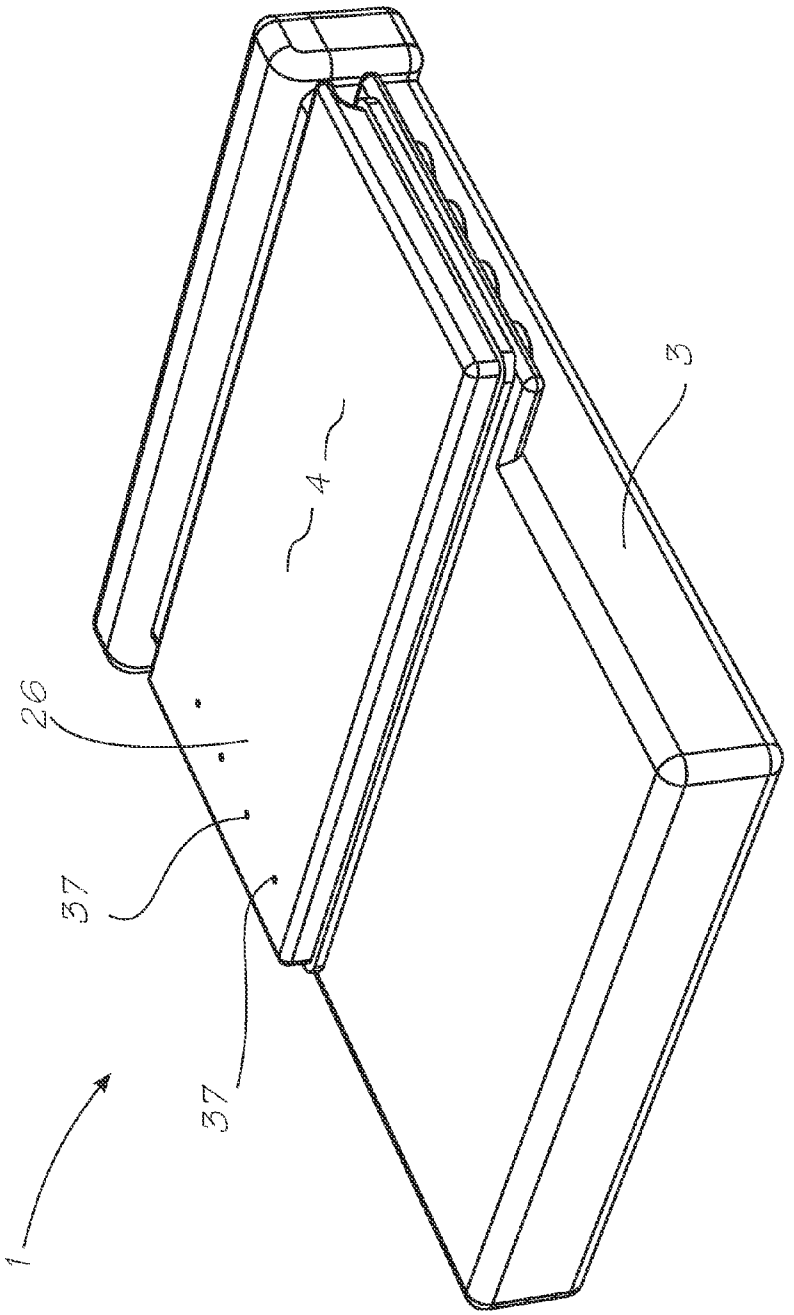

FIG. 2

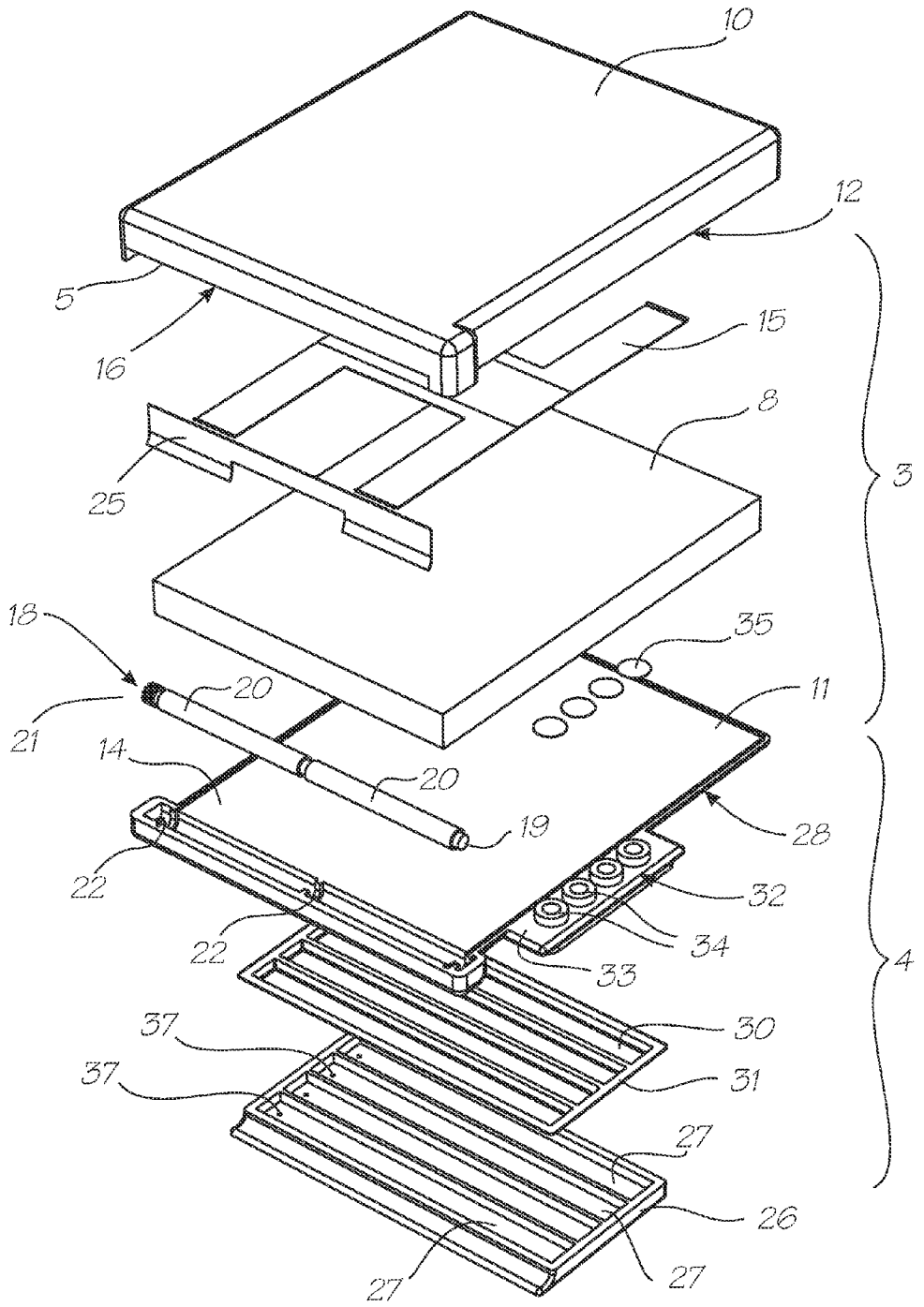
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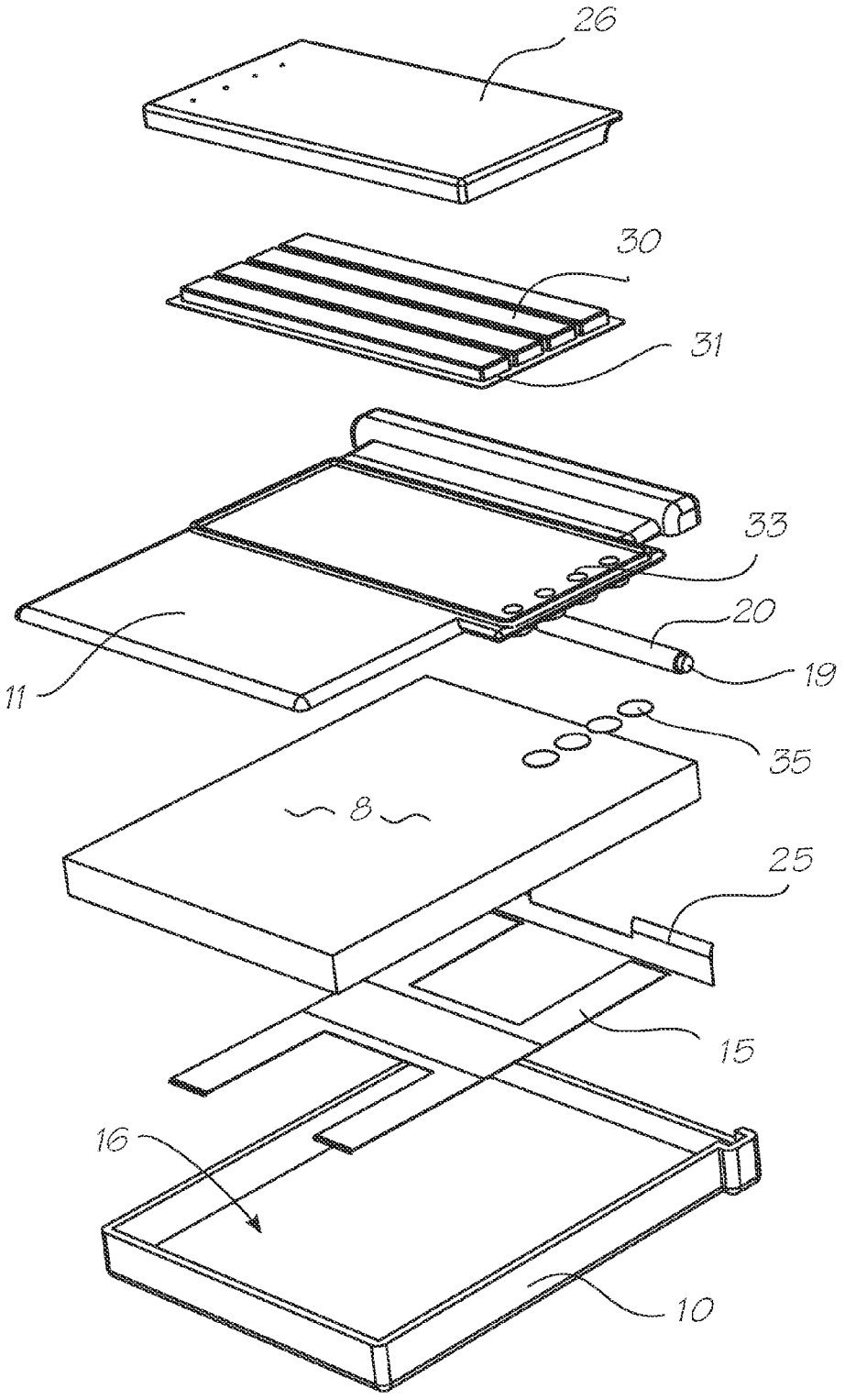
FIG. 3



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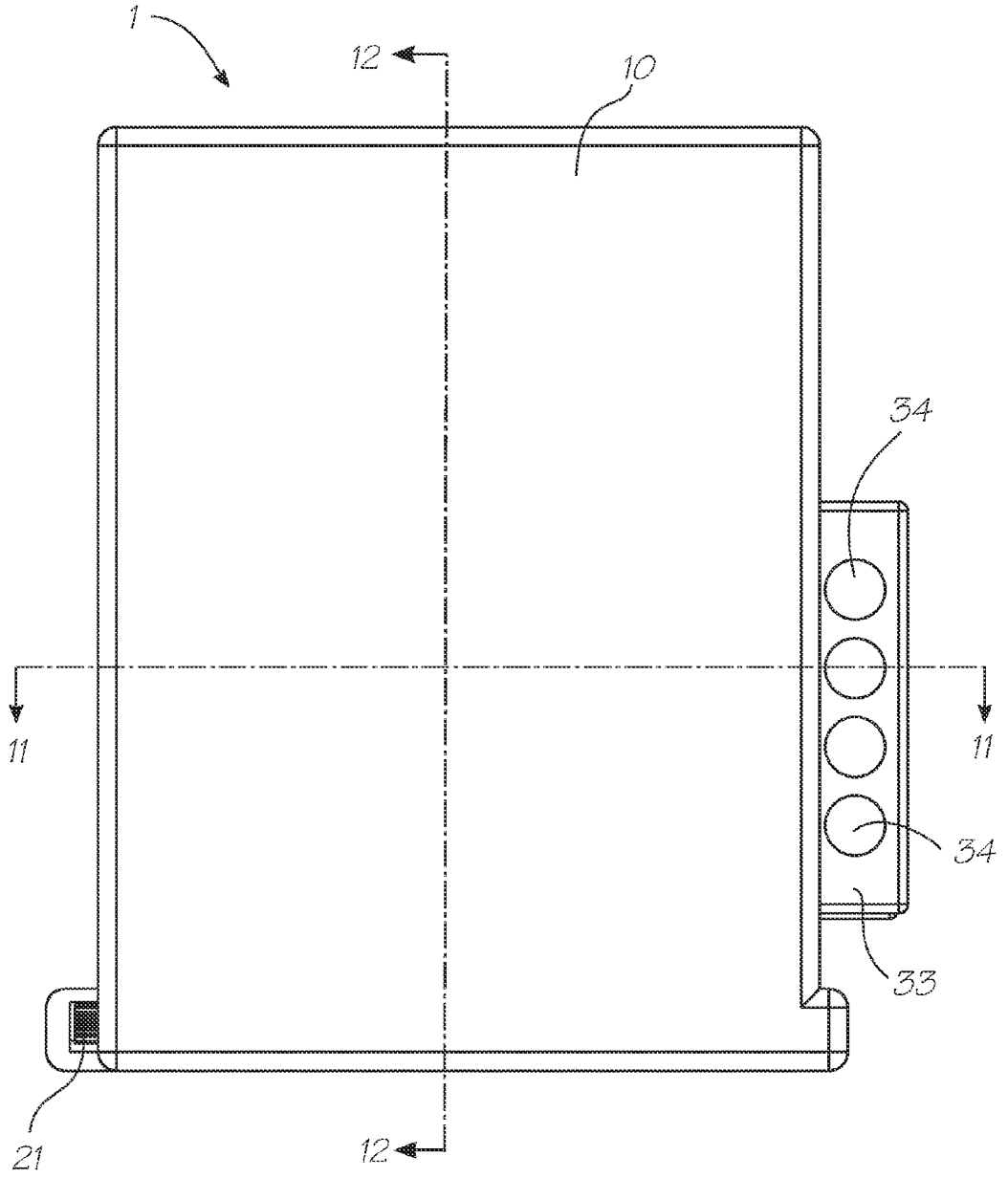

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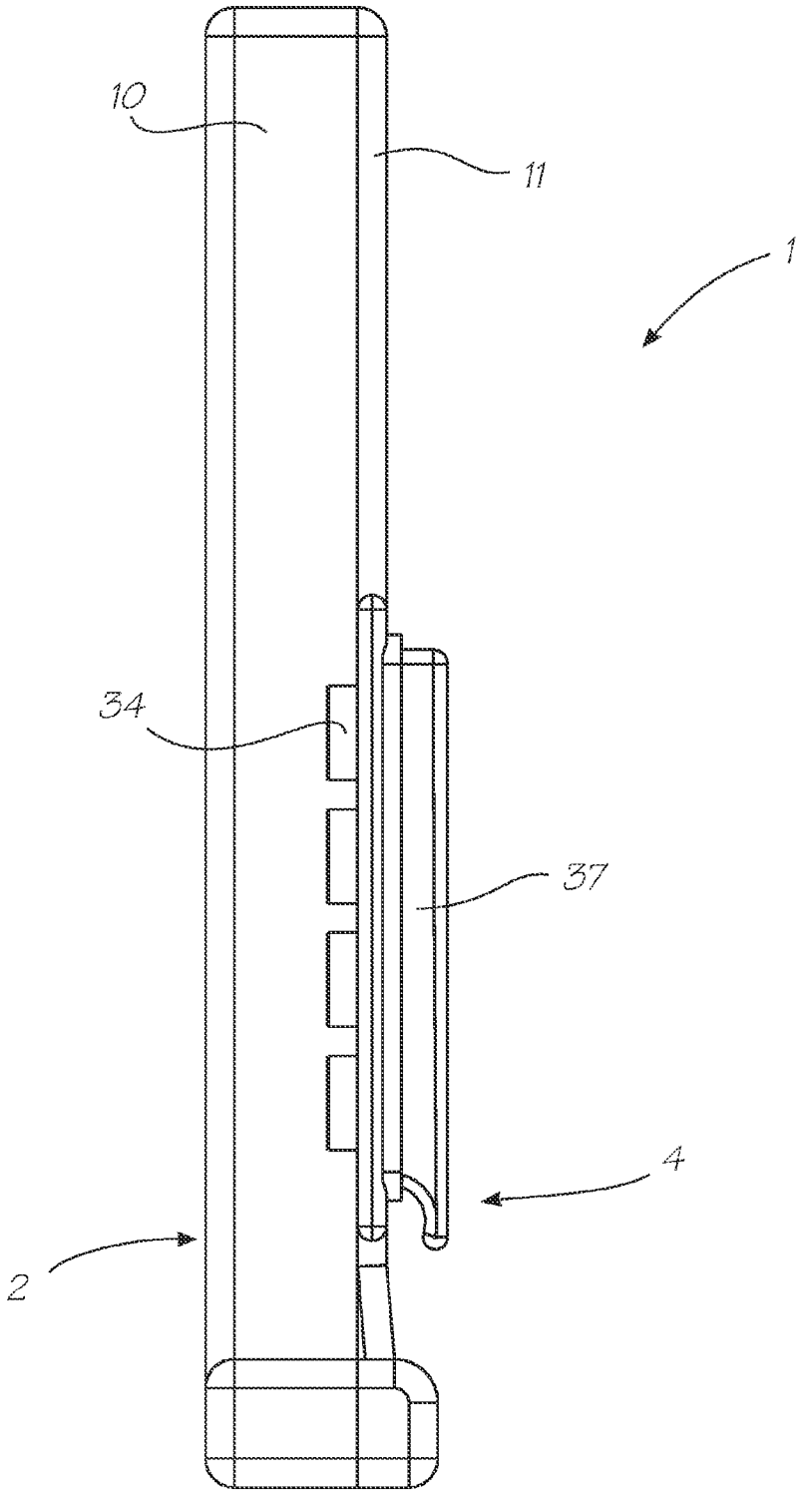

FIG. 6

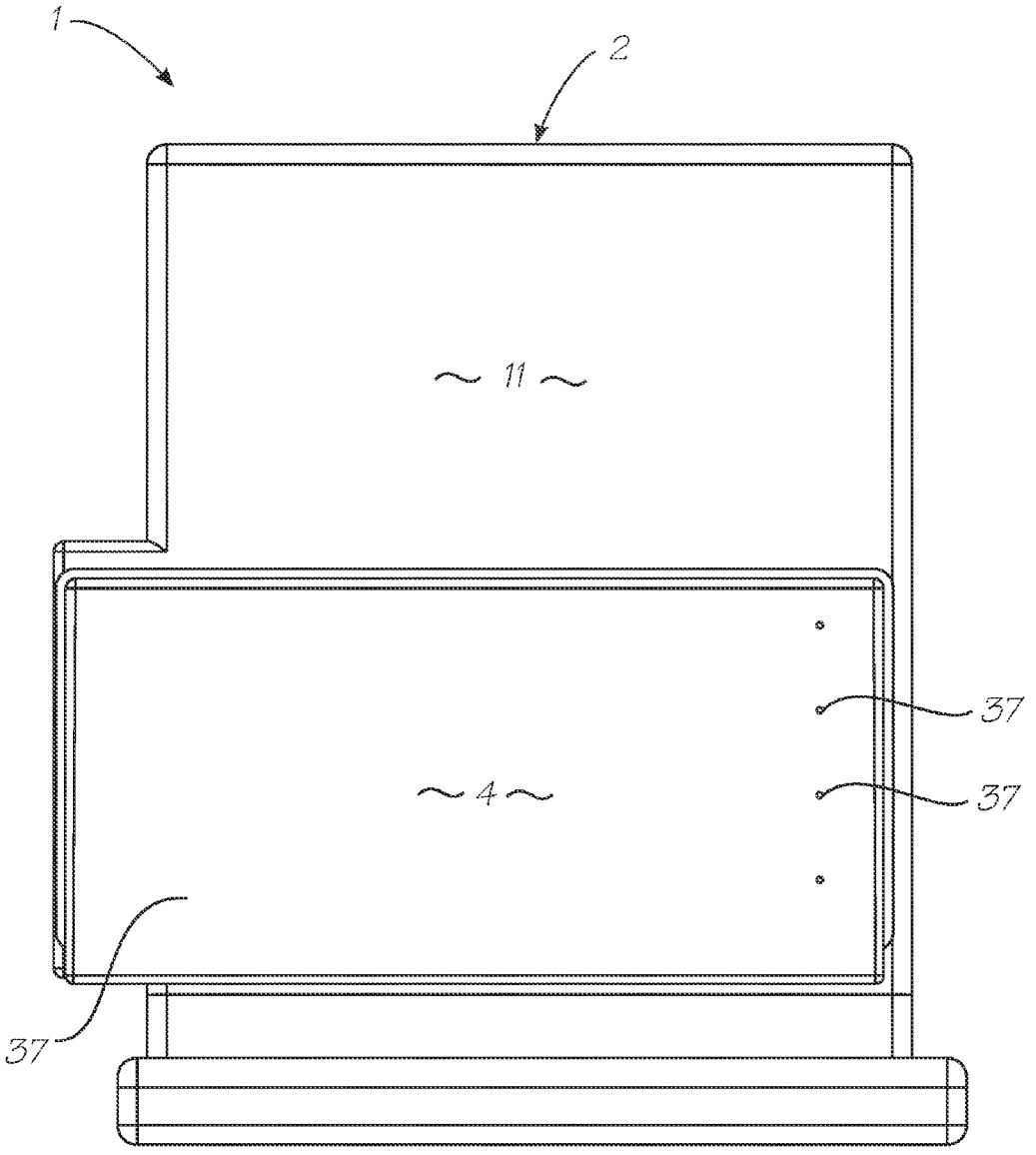

FIG. 7

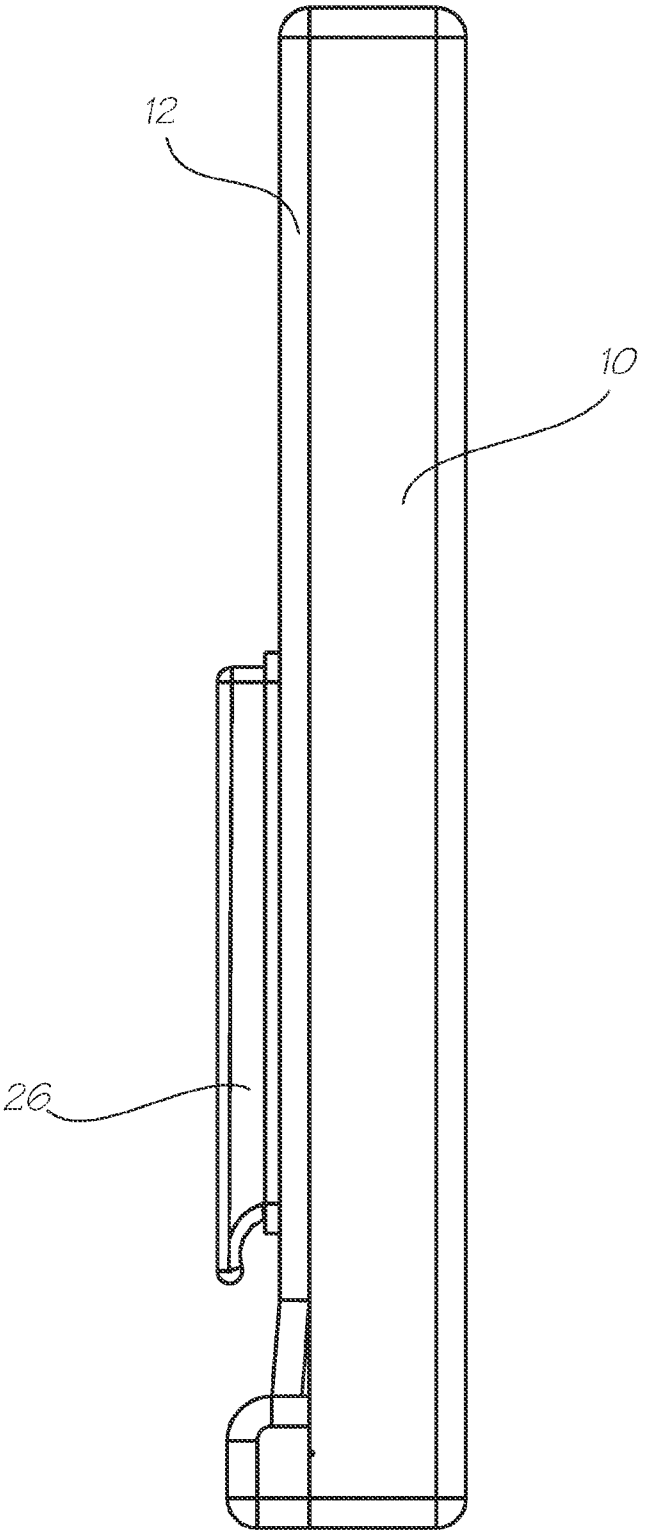

FIG. 8

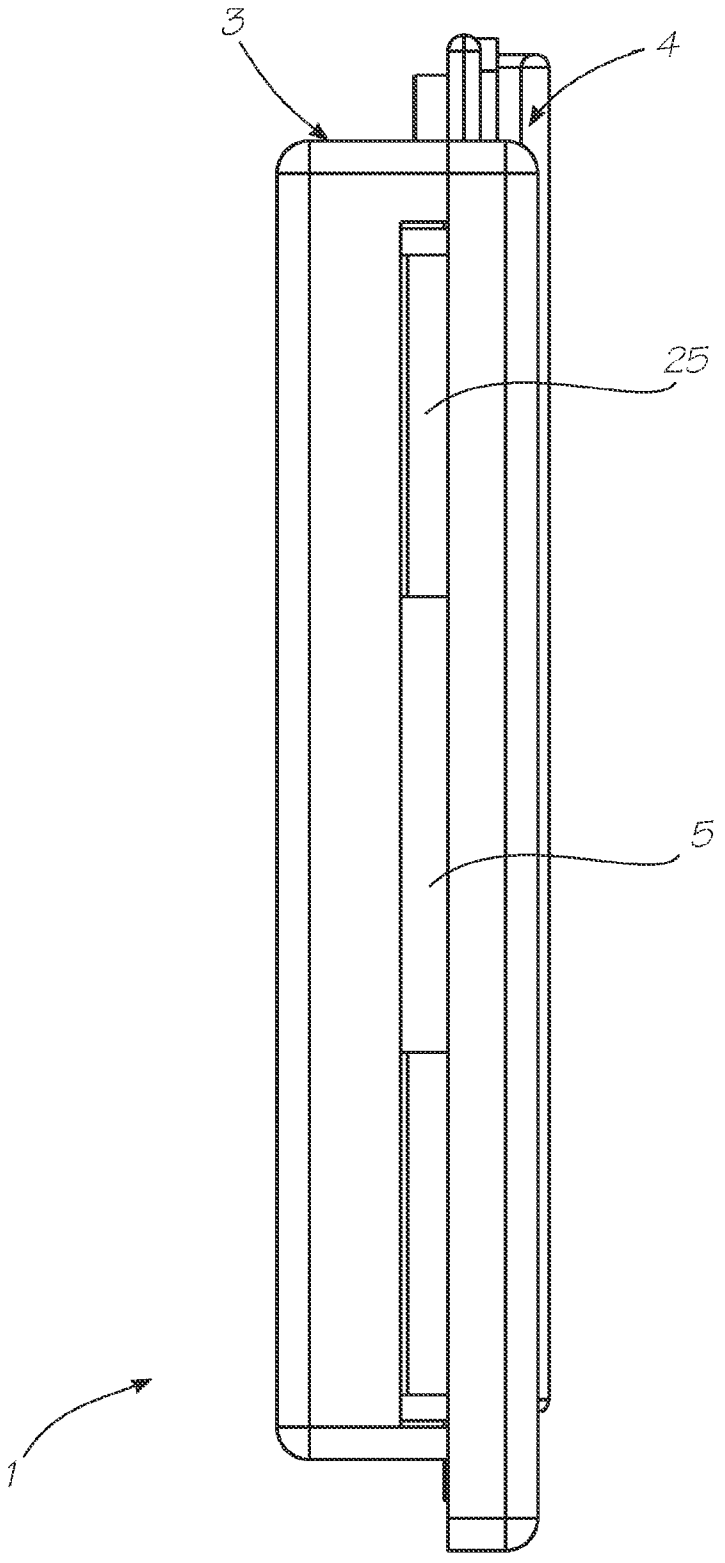

FIG. 9

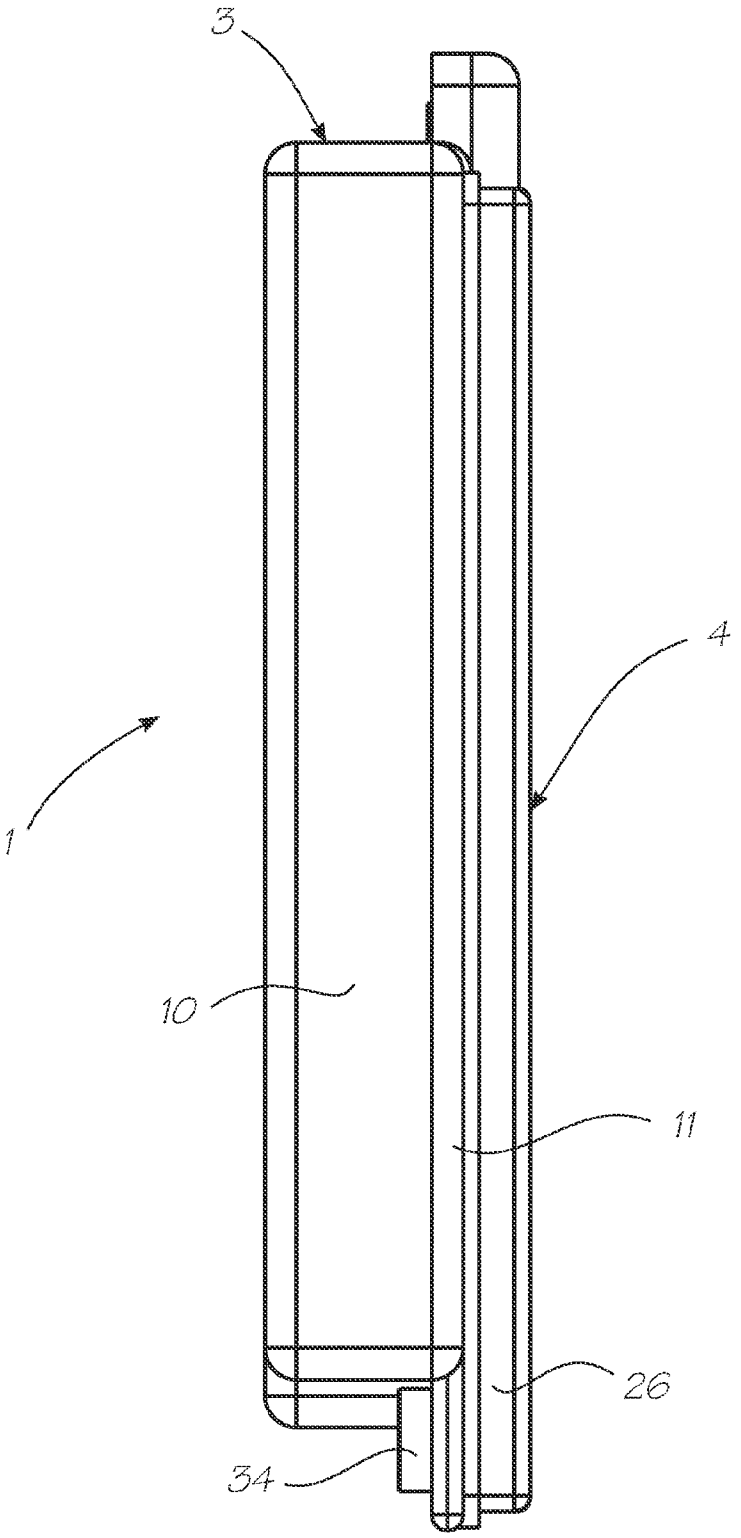

FIG. 10

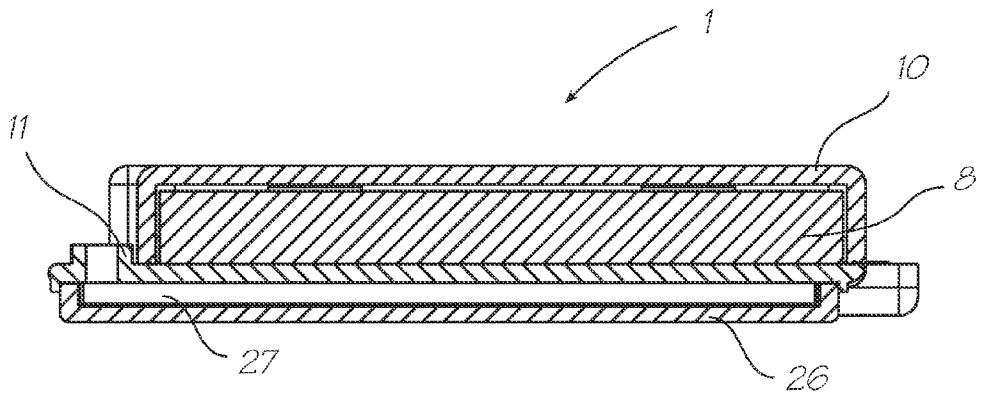

FIG. 11

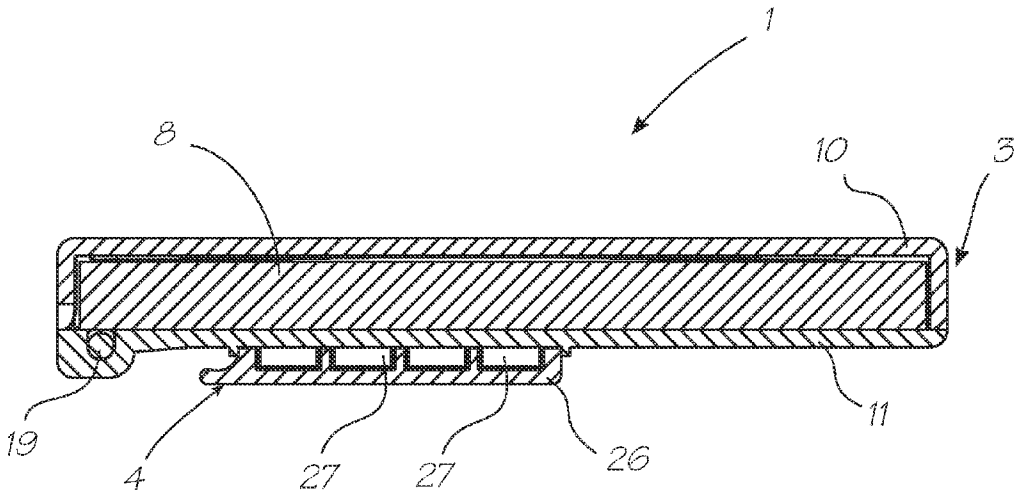

FIG. 12

PRINT MEDIA CARTRIDGE WITH INK SUPPLY MANIFOLD

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a Continuation of U.S. application Ser. No. 12/541,121 filed on Aug. 13, 2009, which is a Continuation of U.S. application Ser. No. 11/203,188 filed Aug. 15, 2005, now issued as U.S. Pat. No. 7,588,323 which is a Continuation of U.S. application Ser. No. 10/659,016 filed on Sep. 11, 2003, now issued as U.S. Pat. No. 6,951,390 which is a Continuation of U.S. application Ser. No. 09/436,508 filed on Nov. 9, 1999, now issued as U.S. Pat. No. 6,626,529, the entire contents of which are herein incorporated by reference.

FIELD OF THE INVENTION

The present invention relates to print media supply cartridges for printers, and more particularly, to print media supply cartridge for use as a combined paper and ink supply cartridge.

SUMMARY OF THE INVENTION

According to an aspect of the present disclosure, an ink and print media cartridge for a printer device comprises a print media housing assembly configured for insertion and removal to and from the printer device, the print media housing assembly having a top molding coupled to a bottom molding and a print media storage volume defined therebetween; an ink housing assembly attached to an outer surface of the bottom molding, the ink housing assembly defining an ink chamber with the outer surface of the bottom molding; a spring provided between the top molding and the bottom molding, the spring positioned to bear on one side against the top molding and on an opposite side against print media stored in the print media storage region; and a feed mechanism provided within the print media housing, the feed mechanism including a drive gear protruding externally from the print media housing. The drive gear is positioned to engage with a complimentary drive mechanism of the printer device upon insertion of the print media housing into the printer device.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

FIG. **1** is a top perspective view of a cartridge in accordance with the invention;

FIG. **2** is an inverted perspective view of the cartridge shown in FIG. **1**;

FIG. **3** is an exploded perspective top view shown in the same orientation as that shown in FIG. **1**;

FIG. **4** is an exploded inverted perspective view shown in the same orientation as FIG. **2**;

FIG. **5** is a top plan view of the cartridge of the previous figures;

FIG. **6** is a right hand side view of the cartridge shown in FIG. **5**;

FIG. **7** is an inverted plan view of the cartridge of the previous figures;

FIG. **8** is a left hand side view of the same cartridge;

FIG. **9** is a front view of the same cartridge;

FIG. **10** is a rear view of the same cartridge;

FIG. **11** is a sectional rear view taken on line **11-11** of FIG. **5**; and

FIG. **12** is a sectional side view taken on line **12-12** of FIG. **5**.

DESCRIPTION OF PREFERRED AND OTHER EMBODIMENTS

Referring to the drawings, there is shown a cartridge **1** for a printing device including a casing shown generally at **2**. In the illustrated preferred form, the casing is divided into two main portions comprising, a print media supply portion **3** for housing sheets of paper and the like, and a second storage portion **4** for housing an ink supply. This cartridge is designed for use with digital printing devices, and is particularly suitable for drop-on-demand ink jet printing devices.

The casing **2** also defines a print media exit opening **5** that connects with the print media storage portion **3** and a print media transport mechanism shown generally at **7**. This transport mechanism is disposed within the print media housing portion **3** adjacent the print media exit **5**, such that upon operation it picks up and drives the print media **8** out through the print media exit opening.

Turning first to consider the elements of the print media storage portion of the cartridge, it can be seen to comprise a media top molding **10** which mates with a corresponding bottom molding **11**. In this manner the moldings combine to define a generally rectangular print media storage region **12** in which is housed print media in the form of a stack of paper sheets or cards.

The top and bottom moldings **10** and **11** are both configured at a front end to define, in combination, the print media exit opening **5**. In use, the stack of cards **8** is disposed within the storage region **12**. These are biased downwardly toward engagement with an upper surface **14** of the bottom molding **11** by means of thin metal springs **15** which bear against an inner lower surface **16** of the top molding **10**.

The print media transport mechanism of the preferred form illustrated is in the form of a geared pick up roller assembly **18**. This assembly includes a drive shaft **19**, pick up rollers **20** that are rigidly secured to the drive shaft, and an external drive gear **21**.

The transport assembly **18** is captively retained within the casing portion formed by the top and bottom print media moldings, the drive shaft **19** being rotatably supported by means of arcuate ribs **22** formed in a channel **23** located beneath the exit opening **5**. The top molding fully encloses the portion of the drive shaft holding the pick up rollers **20**, but leaves the external drive gear **21** exposed as shown. In an alternate form, the drive gear may be accessed via an opening in the casing for engagement with a corresponding powered roller on the printer device. A plastic or metal foil **25** is also provided adjacent the exit opening **5**. This foil is sized to extend downwardly across the exit such that once the transport mechanism is operated, only a single sheet of paper or card is driven through the exit at any one time.

The ink storage portion **4** is similarly defined by two separate moldings forming part of the cartridge casing. The primary molding is the ink storage base molding **26** which is configured to define a plurality of distinct ink chambers **27**. Ultimately, the chambers are sealed by direct or indirect connection of this base molding **26** to a cover molding, which in this preferred form is provided by an underside **28** of the print media storage bottom molding **11**.

In the preferred form shown, the connection of the two moldings is indirect, as there is provided an intermediate thin walled deformable film **30** which is preferably initially con-

toured to nest within the ink chambers **27** defined in the base molding **26**. During assembly, the base molding **26** is sealingly connected with a flange **31** provided around the periphery of the thin walled deformable film **30** which in turn is sealingly connected with the underside **28** of the print media storage bottom molding **11**.

As can be seen from the drawings, the ink chambers base molding **27** preferably extends beyond the peripheral edge of the print media storage region above, so as to define an ink supply connection manifold region **32**. The upper portion of the manifold **32** is formed as an extension **33** of the print media storage bottom molding **11** and includes thereon a plurality of ink connection nozzles **34** which are closed by means of pierceable ink seals **35**. In use the ink is stored above the deformable film and is thereby in fluid communication with the ink connection nozzles **34**. In order to facilitate collapsing of the deformable film **30** as the ink is withdrawn, air vents **37** are provided in the ink storage base molding **26**, preferably at the end remote from the ink nozzles. The various components of the cartridge casing can be assembled by any suitable means including use of adhesives, ultrasonic welding or mechanical fasteners or the like.

A preferred application of the cartridge of the invention as hereinbefore described is for use in a video games console having an integral printer of the kind described in Australian provisional patent application PP7020 and corresponding US application entitled "A video game console with integral printer device" filed concurrently herewith, the contents of which are incorporated herein by reference.

In use, the cartridge of the invention is inserted into an appropriately configured printer device whereby the drive gear **21** aligns with and engages a corresponding driven gear provided on the printer mechanism. The advantages of this configuration are numerous. Most importantly, the provision of the transportation means within the cartridge ensures that the paper or other print media is fed out of the cartridge accurately and with minimum initial contamination, as the mechanism and print media are housed within an enclosed unit. In cartridges of the prior art, the cartridge is pressed onto a pick up roller mounted in the printer device, which exposes the paper on the underside. By contrast, the present design allows for greater structural integrity as there is no need to provide an opening that exposes the print media to that same extent. Further, the design provides for a tamper proof unit.

Additional advantages relating to the preferred forms include the provision of seals over the ink outlet nozzles that are pierceable automatically by the printer mechanism upon loading. In this regard, the cartridge is intended only as a single use product. Additionally, the structure of the ink chamber molding whereby the deformable film and base can be molded or joined in a simultaneous operation to form a completely sealed ink chamber, clearly offers manufacturing cost and efficiency advantages.

It will be appreciated by those skilled in the art that whilst the invention has been described with reference to a specific example, the concept can be embodied in many other forms. For example, the print media transport mechanism need not be limited to a pick up roller mechanism, but could include any other suitable mechanisms which can be externally driven from outside the cartridge casing. Similarly, the means of storage of the ink is not limited to the form described and could include the use of other deformable or non-deformable storage means. Accordingly, the preferred embodiment described should be considered in all respects to be illustrative and not restrictive.

We claim:

1. An ink and print media cartridge for a printer device, the ink and print media cartridge comprising:

a print media housing assembly configured for insertion and removal to and from the printer device, the print media housing assembly having a top molding coupled to a bottom molding and a print media storage space defined therebetween;

an ink housing assembly attached to an outer surface of the bottom molding, the ink housing assembly defining an ink chamber with the outer surface of the bottom molding;

a spring provided between the top molding and the bottom molding, the spring positioned to bear on one side against the top molding and on an opposite side against print media stored in the print media storage space; and

a feed mechanism provided within the print media housing, the feed mechanism including a drive gear protruding externally from the print media housing, wherein the drive gear is positioned to engage with a complimentary drive mechanism of the printer device upon insertion of the print media housing into the printer device, wherein a portion of the feed mechanism is rotatably supported by arcuate ribs formed in a channel located beneath an opening in the print media housing assembly for feeding the print media.

2. The ink and print media cartridge according to claim **1**, wherein the feed mechanism, including a geared roller assembly.

3. The ink and print media cartridge according to claim **2**, wherein the top and bottom moldings define a slot from which print media stored in the print media storage volume are fed by the geared roller assembly.

4. The ink and print media cartridge according to claim **2**, wherein the geared roller assembly includes a pick up roller mounted on a drive shaft and positioned to engage print media stored in the print media storage volume, and the top and bottom moldings define a formation in which the drive shaft is rotatably positioned.

5. The ink and print media cartridge according to claim **1**, wherein a portion of the bottom molding extends beyond a peripheral edge of the top molding to define an ink supply connection manifold.

6. The ink and print media cartridge according to claim **5**, comprising an ink outlet in fluid communication with the ink chamber, wherein the ink outlet is provided on the ink supply connection manifold.

7. The ink and print media cartridge according to claim **1**, wherein the feed mechanism includes a drive shaft and a roller, wherein the top molding encloses the portion of the drive shaft holding the rollers.

8. The ink and print media cartridge according to claim **7**, wherein the top molding does not enclose the drive gear.

9. The ink and print media cartridge according to claim **1**, comprising a foil provided adjacent to the opening for feeding the print media.

10. The ink and print media cartridge according to claim **9**, wherein the foil is configured to extend downwardly across the opening for feeding the print media.

11. The ink and print media cartridge according to claim **1**, wherein the ink housing assembly includes an ink storage base molding with ink chambers, and wherein the ink storage base molding is indirectly connected with the outer surface of the bottom molding.

12. The ink and print media cartridge according to claim **1**, wherein the ink housing assembly includes a thin walled deformable film and an ink storage base molding with ink

chambers, and wherein the ink storage base molding is connected with the outer surface of the bottom molding via the thin walled deformable film.

13. The ink and print media cartridge according to claim **1**, wherein the ink housing assembly includes a film and an ink storage base molding with ink chambers, wherein the ink storage base molding is connected with the outer surface of the bottom molding via the film, and wherein the film is contoured to nest within the ink chambers.

14. The ink and print media cartridge according to claim **13**, wherein the ink storage base molding is sealingly connected with a flange provided around a periphery of the file.

15. The ink and print media cartridge according to claim **14**, wherein the film is sealingly connected with the outer surface of the bottom molding.

16. The ink and print media cartridge according to claim **1**, wherein the ink housing assembly includes an ink storage base molding with ink chambers, and wherein the ink storage base molding extends beyond a peripheral edge of the print media storage space.

17. The ink and print media cartridge according to claim **16**, wherein a portion of the ink storage base molding that extends beyond the peripheral edge of the print media storage space forms an ink supply connection manifold region.

18. The ink and print media cartridge according to claim **17**, wherein the ink supply connection manifold region is configured to provide one or more ink nozzles.

19. The ink and print media cartridge according to claim **18**, wherein the one or more ink nozzles are closed by one or more ink seals.

20. The ink and print media cartridge according to claim **1**, wherein the ink housing assembly includes a thin walled deformable film and an ink storage base molding with ink chambers, wherein the ink storage base molding is connected with the outer surface of the bottom molding via the thin walled deformable film, wherein ink is stored above the thin walled deformable film and is in fluid communication with one or more ink nozzles.

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